

**Claims**

1. In a receiver of a communication system, a method for reducing noise in a transformed signal, said transformed signal having a plurality of signal components, said method comprising the steps of:
  - receiving a transformed signal by a detector of said communication system;
  - processing said transformed signal; and
  - reconstructing a predetermined number of times, by a reconstructing module, one or more signal components of said plurality of signal components, said reconstructing being based upon said processing step to thereby reduce noise in said transformed signal;wherein said processing step further comprises the steps:
  - identifying said one or more signal components based upon a channel estimate of said plurality of signal components; and
  - further wherein said reconstructing step further comprises the step of providing a reconstructed transformed signal of said transformed signal.
2. The method as claimed in Claim 1, wherein said processing step comprises the step of providing an estimated signal from said transformed signal at output of said detector and based upon said channel estimate.
3. The method as claimed in Claim 2, wherein said processing step further comprises the step of decision processing said estimated signal using a plurality of decision modules.
4. The method as claimed in Claim 3, wherein said decision processing step comprises the step of soft decision processing.

5. The method as claimed in Claim 3, wherein said decision processing step comprises the step of hard decision processing.
6. The method as claimed in Claim 1, wherein said reconstructing step further comprises the step of providing another estimated signal from said reconstructed transformed signal at said output of said detector and based upon said channel estimate.
7. The method as claimed in Claim 6, wherein said processing step further comprises the step of decision processing said another estimated signal using said plurality of decision modules.
8. The method as claimed in Claim 7, wherein said decision processing of said another estimated signal comprises the step of soft decision processing.
9. The method as claimed in Claim 7, wherein said decision processing of said another estimated signal comprises the step of hard decision processing.
10. The method as claimed in Claim 7, wherein said reconstructing step further comprises the step of determining whether said one or more signal components has been reconstructed said predetermined number of times
11. The method as claimed in Claim 10, wherein said reconstructing step further comprises the step of determining whether to process another one or more signal components of said plurality of signal components.
12. The method as claimed in Claim 11, and further comprising the step of providing current estimated signal for subsequent processing when determined that iteration of said another signal component is not required.

13. The method as claimed in Claim 11, wherein said reconstructing step further comprises the step of simultaneously reconstructing two or more of said another one or more signal components.
14. The method as claimed in Claim 11, wherein said reconstructing step further comprises the step of reconstructing, one at a time, each of said another one or more signal components.
15. The method as claimed in Claim 1, wherein said reconstructing step further comprises the step of simultaneously reconstructing two or more of said one or more signal components.
16. The method as claimed in Claim 1, wherein said reconstructing step further comprises the step of reconstructing, one at a time, each of said one or more signal components.
17. A receiver for reducing noise in a transformed signal, said transformed signal having a plurality of signal components, said receiver comprising:
  - a signal reconstructing section having:
    - a detector for detecting said transformed signal;
    - one or more decision modules, each of said one or more decision modules having an input coupled to output of said detector; and
    - a reconstructing module having one or more inputs, said one or more inputs being respectively coupled to output of said one or more decision modules,
  - wherein said reconstructing module is adapted to reconstruct one or more signal components of said plurality of signal components a predetermined number of times to thereby form a noise-reduced transformed signal; and

wherein said reconstructing module is adapted to provide a reconstructed transformed signal of said transformed signal;

further wherein said reconstructing module is adapted to identify said one or more signal components based upon a channel estimate of said plurality of signal components.

18. The receiver as claimed in Claim 17, wherein said one or more decision modules comprises one or more hard decision modules.
19. The receiver as claimed in Claim 17, wherein said one or more decision modules further comprises one or more soft decision modules.
20. The receiver as claimed in Claim 17, wherein said reconstructing module is adapted to perform reconstruction based on a relationship between a received signal component and a transmitted signal.
21. The receiver as claimed in Claim 17, wherein said reconstructing module is adapted to perform simultaneous reconstruction of two or more of said one or more signal components.
22. The receiver as claimed in Claim 17, wherein said reconstructing module is adapted to perform reconstruction of said one or more signal components signal components one at a time.
23. A communication system comprising:
  - a signal reconstructing section for reducing noise in a transformed signal, said transformed signal having a plurality of signal components, said signal reconstructing section having:
    - a detector for detecting said transformed signal;

one or more decision modules, each of said one or more decision modules having an input coupled to output of said detector; and

a reconstructing module having one or more inputs, said one or more inputs being respectively coupled to output of said one or more decision modules,

wherein said reconstructing module is adapted to reconstruct one or more signal components of said plurality of signal components by a predetermined number of times to thereby form a noise-reduced transformed signal;

wherein said reconstructing module is adapted to provide a reconstructed transformed signal of said transformed signal;

further wherein said reconstructing module is adapted to identify said one or more signal components based upon a channel estimate of said plurality of signal components.

24. The communication system as claimed in Claim 23, wherein said one or more decision modules comprises one or more hard decision modules.
25. The communication system as claimed in Claim 23, wherein said one or more decision modules further comprises one or more soft decision modules.
26. The communication system as claimed in Claim 23, wherein said reconstructing module is adapted to perform reconstruction based on a relationship between a received signal component and a transmitted signal.
27. The communication system as claimed in Claim 23, wherein said reconstructing module is adapted to perform simultaneous reconstruction of two or more of said one or more signal components.

28. The communication system as claimed in Claim 23, wherein said reconstructing module is adapted to perform reconstruction of said one or more signal components signal components one at a time.
29. A signal reconstructing section for a receiver to reduce noise in a transformed signal, said transformed signal having a plurality of signal components, said signal reconstructing section comprising:
  - a detector for detecting said transformed signal;
  - one or more decision modules, each of said one or more decision modules having an input coupled to output of said detector;
  - and
  - a reconstructing module having one or more inputs, said one or more inputs being respectively coupled to output of said one or more decision modules,
  - wherein said reconstructing module is adapted to reconstruct one or more signal components of said plurality of signal components by a predetermined number of times to thereby form a noise-reduced transformed signal.
  - wherein said reconstructing module is adapted to provide a reconstructed transformed signal of said transformed signal;
  - further wherein said reconstructing module is adapted to identify said one or more signal components based upon a channel estimate of said plurality of signal components.
30. The signal reconstructing section as claimed in Claim 29, wherein said one or more decision modules comprises one or more hard decision modules.
31. The signal reconstructing section as claimed in Claim 29, wherein said one or more decision modules further comprises one or more soft decision modules.

32. The signal reconstructing section as claimed in Claim 29, wherein said reconstructing module is adapted to perform reconstruction based on a relationship between a received signal component and a transmitted signal.
33. The signal reconstructing section as claimed in Claim 29, wherein said reconstructing module is adapted to perform simultaneous reconstruction of two or more of said one or more signal components.
34. The signal reconstructing section as claimed in Claim 29, wherein said reconstructing module is adapted to perform reconstruction of said one or more signal components signal components one at a time.